

# STORAGE

## FAQ

**Q** I've heard that there's a bug in Windows Home Server that can corrupt my data. Is this true?

**A** Unfortunately, it is. If you attempt to edit files stored on the hard disk of a Windows Home Server using certain programs, the files may be corrupted when you save any changes you've made. The affected programs are Microsoft applications, such as Outlook 2007 and Vista's built-in Photo Gallery program.

Microsoft has announced a free update to Windows Home Server called Power Pack 1 that will add new features and refine existing ones. A Microsoft spokesman has confirmed that Power Pack 1 will not fix this data corruption bug and was unable to confirm when a fix would be available.

For updates on the status of this bug, check <http://support.microsoft.com/kb/946676/en-us?spid=12624>.

**Alan Lu**

PC systems and storage expert

[alan@computersshopper.co.uk](mailto:alan@computersshopper.co.uk)



## LG GGW-H20L

★★★★★

£175 inc VAT

From [www.ebuyer.com](http://www.ebuyer.com)



LG's GGW-H20L is the first optical drive we've seen that can play both HD DVD and Blu-ray discs. It is also the first Blu-ray writer we've seen that can write to 50GB Blu-ray discs. Frustratingly, 50GB discs are virtually impossible to buy and we were unable to acquire any for speed testing. It's also disappointing that 50GB discs currently cost about £20 each, while 25GB discs are even poorer value per gigabyte at around £15.

We had no trouble playing either Blu-ray or HD DVD movies using the included PowerDVD software, making the GGW-H20L attractive for use in a media centre PC, especially one with space for only one optical drive. The ability to play HD DVDs isn't all that compelling now that Blu-ray has won the format war, but it's still reassuring to know that you have the ability to play both formats.

The GGW-H20L was incredibly fast at burning write-once 25GB Blu-ray discs, taking just under 22 minutes – the fastest time we've seen so far for a Blu-ray writer. However, we achieved this speed only by disabling BD defect management in Nero. With this enabled, the burn time jumped to just over 53 minutes. Defect management is similar to the verify data option when writing CD and DVD discs, which tries to ensure that the data written to disc isn't corrupted, and has a similar negative effect on write speeds.

The GGW-H20L was far slower when burning rewriteable Blu-ray discs. Filling a 25GB disc took an hour and a half. Its DVD writing speeds were slow compared with



those of dedicated DVD writers, which now claim 20X speeds for single-layer DVDs. The GGW-H20L couldn't match its claimed 16X when writing single-layer discs, managing around 9X. It came close to its claimed 4X for writing two-layer DVDs, though. If you regularly burn DVDs, you may need a dedicated DVD writer.

Although the GGW-H20L is significantly cheaper than the first Blu-ray writers, the cost of blank Blu-ray media hasn't fallen much since they first became available. They still cost around 70p per gigabyte. This is much more expensive than DVDs and hard disks, which cost around 20p per gigabyte. At the moment, Blu-ray discs aren't the best choice for everyday storage.

The GGW-H20L's real appeal is for those who are building or upgrading a media centre PC and want to be able to play both Blu-ray and HD DVD movies. It's cheaper than buying separate Blu-ray and HD DVD drives, although it has a SATA rather than a PATA interface, so make sure your PC has a free SATA connector. You also need a fast dual-core processor and a fast graphics card with an HDMI port to get the most out of HD movies. It may not be perfect, but the GGW-H20L is the first high-definition optical drive we'd recommend, so it deserves its Most Wanted award.

Alan Lu

### SUMMARY

- ✓ Plays Blu-ray and HD DVDs
- ✓ Fast BD-R writing
- ✗ Sluggish DVD burning

BLU-RAY WRITER/HD DVD-ROM DRIVE 6X BD-R, 2X BD-RE, 4X BD-R DL, 2X BD-RE DL, 16X DVD-R, 16X DVD+R, 6X DVD-RW, 8X DVD+RW, 4X DVD-R DL, 4X DVD+R DL, 5X DVD-RAM  
PART CODE GGW-H20L  
DETAILS <http://uk.lge.com/>

### PERFORMANCE (see page 58)



## Also consider...

### COOLER MASTER X Craft 360

★★★★★

£32 inc VAT

From [www.yoyotech.co.uk](http://www.yoyotech.co.uk)



We tested Cooler Master's X Craft 360 disk enclosure with a 320GB Samsung hard disk. Apart from copying large files over eSATA, its performance over both USB and eSATA was in line with our expectations. It's a little noisier than other eSATA enclosures, though. Installing a disk inside the X Craft was effortless since it doesn't require a screwdriver. This alone makes it a useful product.

3 1/2in HARD DISK ENCLOSURE  
Takes one 3 1/2in SATA hard disk, eSATA, USB Hi-Speed interface  
PART CODE RX-360  
DETAILS [www.coolermaster.com](http://www.coolermaster.com)  
FULL REVIEW Dec 2007



### LACIE d2 eSATA II 3Gbits Hard Drive 500GB

★★★★★

£117 inc VAT

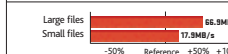
From [www.expansys.com](http://www.expansys.com)

LaCie's d2 external hard disk has a reassuringly heavy metal case but is unusual in having no other interface besides eSATA. Its excellent performance almost matched that of an internal SATA II disk, so it's much faster than any USB or FireWire 400 disk, and quicker than most FireWire 800 disks.

The d2 is a very fast external hard disk and shows the speed benefits of eSATA.



EXTERNAL HARD DISK 500GB capacity, 465GB formatted capacity (NTFS), eSATA  
PART CODE 300976EK  
DETAILS [www.lacie.com/uk](http://www.lacie.com/uk)  
FULL REVIEW Sep 2007



## HI-GRADE Home-serv 2000

★★

£470 inc VAT  
From [www.higrade.com](http://www.higrade.com)

Servers are computers that have been designed specifically to handle network storage, and are an alternative to network attached storage (NAS) devices. Hi-Grade's Home-serv 2000 is a server that runs Microsoft's Windows Home Server (WHS) operating system. We were generally impressed with WHS's ease of use but were disappointed with the poor design of the Home-serv.

The Home-serv 2000 is designed to be managed remotely from another computer on your network using the included WHS Connector software or the Remote Desktop Connection utility in Windows. Unfortunately, we had to connect a keyboard, mouse and monitor directly to the Home-serv to upgrade the drivers for its built-in network card before the other PCs on our network would recognise it. Once this was done, configuring the Home-serv was straightforward thanks to the Connector software's step-by-step instructions. Setting different access rights to different folders for different users was much more straightforward than it has been on many NAS devices we've seen.

The Home-serv comes with two 500GB hard disks for an impressive one terabyte of storage. If that's not enough for your needs, you can add two more hard disks by screwing them into the two hard disk trays and sliding them into the front-mounted expansion bays.

Once the Home-serv has rebooted, WHS automatically detects the hard disk and offers to format it for you and add it to the available pool of storage. The server has four more internal hard disk bays, but to use them you'd need to add a Windows Server 2003-compatible SATA controller with more SATA ports.

The downside to this impressive level of expandability is size. The Home-serv is the same size as a standard midi-tower PC, so it can't be easily tucked away in a cupboard as most NAS devices can. Even worse is the noise. It's easily one of the loudest computers we've tested, which is a significant problem for a server that will be running constantly.

We weren't impressed with the Home-serv's performance in our file transfer tests, either. It was very sluggish at copying large files and remarkably slow at transferring small files. Copying any significant amount of data to and from the Home-serv will be frustrating. We suspect that the lack of Gigabit Ethernet support is to blame for this poor performance.

Watching a DVD movie stored on the Home-serv using a network media player was not an enjoyable experience, thanks to jittery video and sound that fell out of sync with the picture.

Windows Home Server's backup feature isn't designed to make a bootable clone of your PC's hard disk as Norton Ghost does, but it's good for backing up your office



documents, media collection and other files. Each of the computers on your network will be backed up automatically in the background at a time you choose, and after the first backup it copies only changed files to save time. If you add a new hard disk to one of those computers, the Connector software will automatically detect it and ask if you want to back that up too.

Instead of RAID, WHS uses its own technology to mirror your shared folders automatically on another hard disk. This protects them from the possibility of a hard disk breaking down. It's easier to configure than RAID but it doesn't have any of the other potential benefits such as speed improvements.

Ultimately we were disappointed by Hi-Grade's Home-serv 2000. The Windows Home Server operating system is easy to configure and the removable hard disk trays make adding extra storage straightforward. Unfortunately, the poor file-copying performance, the distracting levels of noise and the large case mean we can't recommend it.

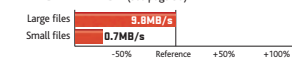
Alan Lu

### SUMMARY

- ✓ Lots of storage; removable disk trays
- ✗ Poor file-copying performance
- ✗ Big and noisy

**HEADLESS HOME SERVER** Intel Celeron 430 processor, 1GB memory, 500GB boot disk, 500GB storage, Intel Graphics Media Accelerator 950 graphics, 6 USB ports  
**PART CODE** Home-serv 2000  
**DETAILS** [www.higrade.com](http://www.higrade.com)

### PERFORMANCE (see page 58)



## WESTERN DIGITAL Scorpio 250GB

★★★★★

£90 inc VAT  
From [www.pcnextday.co.uk](http://www.pcnextday.co.uk)

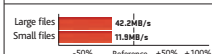


Western Digital's 250GB Scorpio is the roomiest laptop disk

yet, rivaling the capacity of some desktop disks. It is also one of the fastest 2½in hard disks we've seen and, what's more, it didn't reduce the battery life of our laptop, unlike some other 2½in disks.

It all adds up to the best laptop hard disk we've seen, although it won't fit older notebooks since it uses a SATA rather than a PATA connection.

**2½in INTERNAL HARD DISK** 250GB capacity, 232GB formatted capacity (NTFS), SATA interface, 5,400rpm spindle speed  
**PART CODE** 3384-5628  
**DETAILS** [www.westerndigital.com](http://www.westerndigital.com)  
**FULL REVIEW** Jan 2008



## WESTERN DIGITAL Caviar SE16 500GB

★★★★★

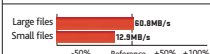
£73 inc VAT  
From [www.aria.co.uk](http://www.aria.co.uk)



Motherboard and hard disk manufacturers

may be phasing out PATA in favour of SATA, but you can still buy PATA hard disks. Western Digital's 500GB internal PATA hard disk is our pick if your computer's motherboard doesn't have any SATA ports. It performed well in both our large and small files tests, and is good value at 16p per gigabyte.

**PATA HARD DISK 500GB** hard disk, 465GB formatted capacity (NTFS), PATA/100 interface, 7,200rpm spindle speed, 16MB cache, 10.9ms seek time, 29dB(A) noise when idle  
**PART CODE** WD5000AAKB  
**DETAILS** [www.westerndigital.com](http://www.westerndigital.com)  
**FULL REVIEW** Apr 2008



## SAMSUNG Super-WriteMaster SE-S204

★★★★★

£43 inc VAT  
From [www.amazon.co.uk](http://www.amazon.co.uk)



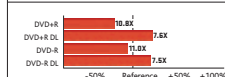
Samsung's Super-WriteMaster

SE-S204 is one of the fastest external DVD burners when writing DVD+R DL and DVD-R DL discs, with speeds of 7.56X and 7.51X.

It achieved 11X speeds in our DVD-R test and over 10X when burning DVD+Rs.

Samsung provides a good software bundle, too.

**EXTERNAL DVD WRITER 20X** DVD-R, 20X DVD+R, 6X DVD-RW, 8X DVD+RW, 12X DVD-R DL, 16X DVD+R DL, 12X DVD-RAM, 48X CD-R, 32X CD-RW  
**PART CODE** SE-S204  
**DETAILS** [www.samsung.com](http://www.samsung.com)  
**FULL REVIEW** Feb 2008



## LACIE USB Key Max 30GB

★★★★★

£79 inc VAT

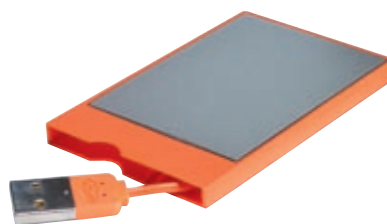
From [www.lacie.com/uk/shop](http://www.lacie.com/uk/shop)

Most of the portable hard disks we've seen contain 2½in disks, and tend to be around the size of a wallet. LaCie's USB Key Max uses a 1in hard disk so it's around the size of a stack of credit cards, weighs only 50g and has a capacity of 30GB. A short 1.5cm USB cable is integrated into the case but thankfully an extension cable is included.

The USB Key Max wasn't as fast as a 2½in portable hard disk in our file transfer tests, but it still performed well overall. Only its slow speed of 1.37MB/s when writing small files let it down.

With a cost per gigabyte of £2.83 the Key Max is expensive compared with a 2½in portable hard disk. It is £20 cheaper than OCZ's 32GB ATV flash drive (see *Labs*, page 111), so it's a good alternative to high-capacity USB flash drives.

Alan Lu



### SUMMARY

- ✓ Small and lightweight
- ✓ Generally good performance
- ✗ High cost per gigabyte

PORTABLE EXTERNAL HARD DISK 30GB capacity, 3,600rpm spindle speed, USB Hi-Speed interface  
PART CODE 301823  
DETAILS [www.lacie.com/uk](http://www.lacie.com/uk)

### PERFORMANCE (see page 58)

|             |          |
|-------------|----------|
| Large files | 18.6MB/s |
| Small files | 5.1MB/s  |

-50% Reference +50% +100%

## ENERMAX Jazz SATA I&II/eSATA

★★★★★

£40 inc VAT

From [www.afterhours.co.uk](http://www.afterhours.co.uk)

Enermax's Jazz hard disk enclosure allows you to connect an internal 3½in SATA hard disk to a USB or eSATA port. The brushed metal and mesh grille design looks classy and feels sturdy. The grille on the top of the enclosure helps to keep the hard disk cool but also exposes it to potential damage from spillages. A SATA-to-eSATA bracket is included, which is useful if your PC lacks an eSATA port.

Fitting a hard disk is easy. The top comes off at the press of a switch, and screwless mounting clips hold the disk in place. We installed a 500GB SATA hard disk and it performed well when connected using either USB or eSATA, although it couldn't quite match the table-topping performance of Antec's Veris MX-1 (see *What's New, Shopper* 237). It's just as quiet as the Veris, though. The Jazz is easy to assemble but it isn't cheap at £40.

Alan Lu



### SUMMARY

- ✓ Simple installation
- ✓ Quiet; good performance
- ✗ Expensive

3½IN SATA HARD DISK ENCLOSURE Takes one 3½in SATA hard disk, USB Hi-Speed, eSATA interface  
PART CODE EB307ES  
DETAILS [www.enermax.co.uk](http://www.enermax.co.uk)

### PERFORMANCE (see page 58)

|             |          |
|-------------|----------|
| Large files | 72.3MB/s |
| Small files | 15.6MB/s |

-50% Reference +50% +100%

## CHOOSING AN... Internal Hard Disk

Follow the steps to find your ideal specs

**CAPACITY:** 250GB

**SPINDLE SPEED:** 7,200rpm

**INTERFACE:** PATA or SATA

Recommended minimum in grey

**1** An internal hard disk with the above specifications should cost around £40. It's fast enough for general use and provides enough storage space for an average user. Make sure you get the interface type that matches your PC.

Parallel ATA (PATA) connectors use wide ribbon cables and are generally found in older computers. The newer Serial ATA (SATA) interface uses a thinner cable and is slightly quicker.

**2** PATA hard disks require a standard four-pin Molex power cable. Some SATA disks can also use a Molex power connector, but others require the newer SATA power connector. If your power supply doesn't have any SATA power leads then you can buy a convertor for around £4 including VAT from [www.maplin.co.uk](http://www.maplin.co.uk).

**3** Buy a hard disk with the capacity that you'll need, but aim to leave a little breathing room, as you'll always need more storage. A 500GB disk strikes the best balance between capacity and low cost per gigabyte, but in general you should buy the largest disk you can afford.

**4** If you want more disk space or you want to protect your data, think about buying hard disks to create a RAID array. These use multiple hard disks to create a single, large, logical disk with better performance or protection for your data. RAID arrays need to be built with hard disks of the same size. Technically, these can be from different manufacturers, but try to get identical drives if you can.

**5** A hard disk's spindle speed is very important as it governs how quickly the disk can transfer data. A spindle speed of 7,200rpm is common in desktop drives and fast enough for most purposes. If you do a lot of video editing or you run demanding applications, a 10,000rpm hard disk can be faster, but it will be a lot more expensive. Desktop hard disks with 5,400rpm spindle speeds aren't common and are quite slow, but they generate less heat and noise so could be a good choice if you're building a small, quiet PC.

## Also consider...

### LG GSA-E50N

★★★★★

£49 inc VAT

From [www.ebuyer.com](http://www.ebuyer.com)



**BEST BUY** LG's GSA-E50N portable DVD writer costs less than £50, but still looks sleek. It performed well in all our tests. It can also password-protect discs using the included copy of Nero. Files are still visible in Windows Explorer but can't be opened without a downloadable utility and your password.

EXTERNAL DVD WRITER 8X DVD-R, 8X DVD+R, 6X DVD-RW, 8X DVD+RW, 6X DVD-R DL, 6X DVD+R DL, 5X DVD-RAM, 24X CD-R, 24X CD-RW  
PART CODE GSA-E50N  
DETAILS <http://uk.lge.com>  
FULL REVIEW Feb 2008

|          |         |
|----------|---------|
| DVD+R    | 8.1MB/s |
| DVD+R DL | 7.4MB/s |
| DVD-R    | 7.4MB/s |
| DVD-R DL | 7.4MB/s |

-50% Reference +50% +100%

### WESTERN DIGITAL Passport 160GB

★★★★★

£55 inc VAT

From [www.amazon.co.uk](http://www.amazon.co.uk)

**PRICE CUT!**



**BEST BUY** Western Digital's Passport has a rubber base that stops it sliding around and a protective flap covering the USB port. It's also cheap at just 45p per gigabyte. It performed fairly well in all our tests, although it was slower writing small files. It isn't the fastest portable disk we've seen, but its low cost per gigabyte and neat design earn it a Best Buy award.

PORTABLE EXTERNAL HARD DISK 160GB capacity, USB Hi-Speed interface  
PART CODE WDXMS1600  
DETAILS [www.western-digital.com](http://www.western-digital.com)  
FULL REVIEW Sep 2007

|             |          |
|-------------|----------|
| Large files | 22.8MB/s |
| Small files | 5.1MB/s  |

-50% Reference +50% +100%